# WINONA STATE UNIVERSITY
## NEW AND REVISED COURSE AND PROGRAM APPROVAL FORM

Routing form for new and revised courses and programs.  
Course or Program: **GEOS 345 Dinosaur Field Paleontology**

<table>
<thead>
<tr>
<th><strong>Department Recommendation</strong></th>
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<tbody>
<tr>
<td><strong>Department Chair</strong></td>
<td><strong>9.12.12</strong></td>
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<tr>
<td><strong>Date</strong></td>
<td><strong>e-mail address</strong></td>
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<thead>
<tr>
<th><strong>Dean’s Recommendation</strong></th>
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<tr>
<td><strong>Yes</strong></td>
<td><strong>No</strong></td>
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<td><strong>Charles Smith</strong></td>
<td><strong>9/12/12</strong></td>
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<tr>
<td><strong>Dean of College</strong></td>
<td><strong>Date</strong></td>
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*The dean shall forward their recommendation to the chair of the department, the chair of A2C2, and the Vice President for Academic Affairs.*

<table>
<thead>
<tr>
<th><strong>A2C2 Recommendation</strong></th>
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<tbody>
<tr>
<td><strong>Approved</strong></td>
<td><strong>Disapproved</strong></td>
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<tr>
<td><strong>Chair of A2C2</strong></td>
<td><strong>Date</strong></td>
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<th><strong>Graduate Council Recommendation</strong></th>
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<td><strong>Approved</strong></td>
<td><strong>Disapproved</strong></td>
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<tr>
<td><strong>Chair of Graduate Council</strong></td>
<td><strong>Date</strong></td>
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| **Director of Graduate Studies** | **Date** | |

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<tr>
<th><strong>Faculty Senate Recommendation</strong></th>
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<tbody>
<tr>
<td><strong>Approved</strong></td>
<td><strong>Disapproved</strong></td>
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<tr>
<td><strong>President of Faculty Senate</strong></td>
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<th><strong>Academic Vice President Recommendation</strong></th>
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<tr>
<td><strong>Approved</strong></td>
<td><strong>Disapproved</strong></td>
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<tr>
<td><strong>Academic Vice President</strong></td>
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<th><strong>Decision of President</strong></th>
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<tr>
<td><strong>Approved</strong></td>
<td><strong>Disapproved</strong></td>
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<tr>
<td><strong>President</strong></td>
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Please forward to Registrar.

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<tr>
<th><strong>Registrar</strong></th>
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<tr>
<td><strong>Date entered</strong></td>
<td><strong>Please notify department chair via e-mail that curricular change has been recorded.</strong></td>
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WINONA STATE UNIVERSITY
REQUIRED CHECKLIST FOR ALL CURRICULAR PROPOSALS

Course or Program GEOS 345 Dinosaur Field Paleontology

This checklist enables A2C2 representatives to endorse that their departments have accurately followed the Process for Accomplishing Curricular Change. For each course or program proposal submitted to A2C2, this checklist must be completed, signed by the submitting department's A2C2 representative, and included with the proposal when forwarded for approval. Peer review of proposals is also strongly advised, e.g., departments should discuss and vote on the proposals as submitted to A2C2, rather than on just the ideas proposed or drafts of proposals.

If a proposal fails to follow or complete any aspect of the process, the Course and Program Proposal Subcommittee will postpone consideration of the proposal and return it to the department's A2C2 representative for completion and resubmission. Resubmitted proposals have the same status as newly submitted proposals.

Note: This form need not be completed for notifications.

1. The appropriate forms and the “Approval Form” have been completed in full for this proposal. All necessary or relevant descriptions, rationales, and notifications have been provided.
   - [X] Completed

2a. The “Financial and Staffing Data Sheet” has been completed and is enclosed in this proposal, if applicable.
   - [X] Completed   [ ] NA

2b. For departments that have claimed that “existing staff” would be teaching the course proposed, an explanation has been enclosed in this proposal as to how existing staff will do this, e.g., what enrollment limits can be accommodated by existing staff. If no such explanation is enclosed, the department's representative is prepared to address A2C2's questions on this matter.
   - [X] Completed   [ ] NA

3. Arrangements have been made so that a department representative knowledgeable of this proposal will be attending both the Course and Program Proposal Subcommittee meeting and the full A2C2 meeting at which this proposal is considered.
   - [X] Completed
   - Name and office phone number of proposal's representative: W. Lee Beatty X2241

4. Reasonable attempts have been made to notify and reach agreements with all university units affected by this proposal. Units still opposing a proposal must submit their objections in writing before or during the Course and Program Proposal Subcommittee meeting at which this proposal is considered.
   - [ ] Completed   [X] NA

5. The course name and number is listed for each prerequisite involved in this proposal.
   - [X] Completed   [ ] NA

6. In this proposal for a new or revised program (major, minor, concentration, etc.), the list of prerequisites provided includes all the prerequisites of any proposed prerequisites. All such prerequisites of prerequisites are included in the total credit hour calculations.
   - [ ] Completed   [X] NA

7. In this proposal for a new or revised program, the following information for each required or elective course is provided:
   a. The course name and number.
   b. A brief course description.
   c. A brief statement explaining why the program should include the course.
   - [ ] Completed   [X] NA

8. This course or program revision proposal:
   a. Clearly identifies each proposed change.
   b. Displays the current requirements next to the proposed new requirements, for clear, easy comparison.
   - [X] Completed   [ ] NA

9. This course proposal provides publication dates for all works listed as course textbooks or references using a standard form of citation. Accessibility of the cited publications for use in this proposed course has been confirmed.
   - [X] Completed   [ ] NA

Department's A2C2 Representative or Alternate   Date   [Revised 9-05]
Department: Geoscience  
Date: 10 September 2012

Refer to Regulation 3.4, Policy for Changing the Curriculum, for complete information on submitting proposals for curricular changes.

345  
Dinosaur Field Paleontology  
4

Course No.  
Course Title  
Credits

This proposal is for a(n) ___X___ Undergraduate Course  
_____ Graduate Course

Applies to:  
___X___ Major  
__X___ Minor  
___X___ General Education Program* 
(GEP application will be submitted after course is approved)  
___X___ University Studies Program*

___ Required  
____ Required  
___ Elective  
____ Elective

Broader Perspectives  
Broader Perspectives

Prerequisites: GEP natural science laboratory course or instructor’s permission

Grading method:  
___X___ Grade only  
_____ P/NC only  
_____ Grade and P/NC Option

Frequency of offering: Summers

*For General Education Program course approval, the form Proposal for General Education Program Courses must also be completed and submitted separately according to the instructions on that form. For University Studies Program course approval, the form Proposal for University Studies Courses must also be completed and submitted separately according to the instructions on that form.

Provide the following information:

A. Course Description

1. Catalog description.
2. Course outline of the major topics and subtopics (minimum of two-level outline).
   3.a Instructional delivery methods utilized: (Please check all that apply).

<table>
<thead>
<tr>
<th>Lecture: Auditorium</th>
<th>ITV</th>
<th>Online</th>
<th>Web Enhanced</th>
<th>Web Supplemented</th>
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<tbody>
<tr>
<td>Lecture: Classroom X</td>
<td>Service Learning</td>
<td>Travel Study X</td>
<td>Laboratory X</td>
<td>Internship/Practicum</td>
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<td>Other: (Please indicate) Field work X</td>
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3.b. MnSCU Course media codes: (Please check all that apply).

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<tbody>
<tr>
<td>2. CD Rom</td>
<td>5. Broadcast TV</td>
<td>8. ITV Receiving</td>
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</table>

4. Course requirements (papers, lab work, projects, etc.) and means of evaluation.
5. Course materials (textbook(s), articles, etc.).
6. Assessment of Outcomes
7. List of references.

B. Rationale

1. Statement of the major focus and objectives of the course.
2. Specify how this new course contributes to the departmental curriculum.
3. Indicate any course(s) which may be dropped if this course is approved.

C. Impact of this Course on other Departments, Programs, Majors, or Minors

1. Does this course increase or decrease the total credits required by a major or minor of any other department? If so, which department(s)?
2. Attach letter(s) of understanding from impacted department(s).
Definitions:

01- Satellite:

02- CD Rom:

03- Internet: Predominately = where all, or nearly all, course activity occurs in an online environment. One to two activities may occur face-to-face in a classroom, with the maximum being two activities.

04 – ITV Sending: a course in which students are in the classroom with the instructor, other students join via interactive television technology from other geographically separate locations

05 – Broadcast TV:

06 – Independent Study: a course in which the teacher develops specialized curriculum for the student(s) based on department guidelines in the University course catalog

07 – Taped: a course in which the teacher records the lessons for playback at a later date

08 – ITV Receiving: a course in which students are not in the classroom with the teacher, other students join via interactive television technology from other geographically separate locations

09 – Web Enhanced- Limited Seat Time: For a course in which students are geographically separate from the teacher and other students for a majority of required activities. However, some on-site attendance is required. The course includes synchronous and/or asynchronous instruction.

10 – Web Supplemented- No Reduced Seat Time: For a course utilizing the web for instructional activities. Use of this code may assist your college/university in tracking courses for “smart classrooms” and/or facility usage.

Attach a Financial and Staffing Data Sheet.

Attach an Approval Form with appropriate signatures.

Department Contact Person for this Proposal:

W. Lee Beatty X2241 wbeatty@winona.edu
Name (please print) Phone e-mail address
[Revised 9-7-11]
A. Course Description

Course Catalog Description
GEOS 345 Dinosaur Field Paleontology 4 S.H.
A field-based course that surveys the evolution, history, and paleobiology of dinosaurs and swimming and flying reptiles as well as introduces students to the techniques and practices of paleontological field- and labwork. Two weeks of fieldwork at active Late Cretaceous and Early Paleogene sites are supplemented by laboratory experience and classroom instruction. The course covers a broad range of topics, including principles of evolution, taxonomy, fossilization, geologic time, sedimentary rocks and sedimentary environments, dinosaur anatomy, paleoecology, field and laboratory techniques, and ethical and legal aspects of fossil excavation. Prerequisites: GEP natural science laboratory course or instructor’s permission. Offered Summer session as demand allows.

Course Outline
Meeting 1:
• Introduction
  • Scale of geologic & evolutionary time
    o Relative dating
    o Numeric dating
    o Geologic timescale
• Fossils & taphonomy
  o Modes of fossil preservation
  o Taphonomy
  o Limitations of the fossil record
• Sedimentary rocks and depositional environments
  o Sedimentary rock identification & classification
  o Common depositional environments
• The world of the dinosaurs
  o When did dinosaurs live?
  o Geography
  o Climates during the time of the dinosaurs

Meeting 2:
• Evolution
  o Homology
  o The tree of life
  o Evolution and the fossil record
• Phylogenetic systematics
  o Cladograms
  o Cladograms as tools in understanding evolution
• Origin & diversification of dinosaurs
  o Tetrapods
  o Diapsids
  o The first dinosaurs
• Vertebrate skeletal anatomy
  o Ornithischia
  o Saurischia

Meeting 3:
• Ornithischia
  o Overview
  o Chewing
  o Thyreophorans: armor-bearing dinosaurs
  o Marginocephalia: horned and frilled dinosaurs
  o Ornithopoda: duck-billed dinosaurs
• Saurischia
  o Sauropodomorpha: long-necked dinosaurs
  o Theropoda: carnivorous dinosaurs
• Evolution of birds
  o Feathered theropods
  o Feathers without flight
  o Origin of Aves

Meeting 4:
• Dinosaur thermoregulation
• Dinosaur locomotion
• Sex & social behavior
• Dinosaur senses

Meeting 5:
• Dinosaur extinction and the K-T boundary
  - Geological record of the latest Cretaceous
  - Biological record of the latest Cretaceous
  - Extinction hypotheses
• Fossil hunting: Legalities & Ethics
• Pre-trip wrap up & field safety

Fieldwork
• Techniques of field paleontology
  - Prospecting
  - Taxonomic identification
  - Excavating
  - Jacketing and preparing fossils for transport
• Techniques of laboratory paleontology
  - Fossil stabilization and preparation
  - Fossil casting
  - Museum preparation, display, and education
• Capstone project: The K-T boundary
  - Description and stratigraphy of K-T boundary sites
  - Paleoenvironmental analysis

Course requirements and means of evaluation
We will meet for five 3-hour classroom sessions before fieldwork begins. These sessions will cover the basics of geology, evolution, dinosaur physiology and diversity (see course outline for specific topics). Quizzes during these sessions will evaluate students’ understanding of the material. Work at the field sites will provide opportunities to cover paleontological field and lab techniques, as well as additional opportunities to expand on topics introduced in the lectures.

Assessment of Outcomes
Students will be assessed as follows:
- 4 Quizzes: 20%
- Classroom participation: 15% (timeliness, level of engagement, focus, quality of discussion)
- Capstone project: 20% (quality of observations and interpretations, clarity of presentation, effort in the project)
- Participation in field activities: 15% (timeliness, effort, focus, quality of work)
- Participation in lab activities: 15% (timeliness, effort, focus, quality of work)
- Proficiency in field and lab techniques: 15%

Grading (Students must take the course for a letter grade):
A = 90 – 100%
B = 80 – 89%
C = 70 – 79%
D = 60 – 69%
F = < 60%

Course materials
Required text:

Bibliography/Additional References:
B. **Rationale**

**Major Focus and Course Objectives**
This proposed travel study course surveys the evolution, history, and paleobiology of dinosaurs and swimming and flying reptiles. It will cover principles of evolution, taxonomy, fossilization, geologic time, sedimentary rocks and sedimentary environments, vertebrate anatomy, paleoecology, and other principles of geology and biology. The course has a significant field component, and students will spend several weeks participating in active Late Cretaceous and Early Paleogene fossil excavations and preparing and casting fossil bones. It is designed to engage science- and non-science students in scientific thought through discussions of evolution, anatomy, paleoecology, sedimentary environments, geologic time, etc. and build student confidence in their ability to ask pertinent scientific questions and develop appropriate tools to answer those questions.

Pending approval, this course will be submitted to fulfill the natural science requirement for the General Education Program. It is intended for anyone with an interest in dinosaurs or paleontology. The pre-trip course material is intended as an introductory survey of the dinosaurs, while the fieldwork component and capstone project are designed to develop both field and laboratory skills, reinforce classroom material and challenge students to synthesize scientific hypotheses from field observations and data (results typically expected in a 300- or 400-level course). Students are expected to do significant out-of-class preparation for this course. Although students’ expected prerequisite knowledge for this course is low, the level of intellectual investment and maturity required to succeed in the course is high. This combination justifies the listing as a 300-level GEP natural science course.

**How the Course Will Contribute to the Geoscience Department Curriculum**
GEOS 345 will become an additional elective in our upper-level course offerings for our majors and minors and will provide students with an opportunity to develop field skills as well as an understanding of ancient life and environments. The interdisciplinary nature of the course will allow students to make connections between biology, geology, environmental science, and public policy.

**Course(s) which may be dropped**
None.

C. **Impact of this Course on other Departments, Programs, Majors, or Minors**
No impact on courses taught in other departments is anticipated. This course does not duplicate the content of courses taught in other departments. There is no anticipated effect on prerequisites.

**Would Approval of this Course Increase/Decrease the Total Credits Required by any Major/Minor of any other Department?**
Approval of GEOS 345 would not change the number of credits required for any major or minor in other departments.
Include a Financial and Staffing Data Sheet with any proposal for a new course, new program, or revised program.

Please answer the following questions completely. Provide supporting data.

1. Would this course or program be taught with existing staff or with new or additional staff? If this course would be taught by adjunct faculty, include a rationale.

   Geoscience 345 Dinosaur Field Paleontology will be taught by existing staff (one of the faculty in the department is a paleontologist) during Summer sessions.

2. What impact would approval of this course/program have on current course offerings? Please discuss number of sections of current offerings, dropping of courses, etc.

   This course would not affect current course offerings because it will be taught only during the Summer session. GEOS 345 will add to our current list of upper-level electives for our majors and minors.

3. What effect would approval of this course/program have on the department supplies? Include data to support expenditures for staffing, equipment, supplies, instructional resources, etc.

   No additional funds will be necessary to begin this course. The Geoscience Department has the necessary equipment for the field component of this class.